Dewatering Activities at Pabco Road August 2 through September 29, 2000
Final Phase II Construction Report

Prepared for

Clark County Parks and Recreation

By

James E. Pollard

Harry Reid Center for Environmental Studies
University of Nevada, Las Vegas
4504 Maryland Parkway
P.O. Box 454009
Las Vegas, Nevada 89154-4009

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INTRODUCTION

The information contained herein details the dewatering activities associated with Phase II construction of the Pabco Road Erosion Control Structure including perchlorate releases and TDS levels in dewatering effluent as specified in the revised Rolling Stock Permit # TNEV99008. Previous reports on dewatering activities have been provided on 3/31/00, 7/3/00, and 8/21/00. This is the final report which provides permit required dewatering documentation for the last phase of construction of this project which concludes all dewatering activities.

DOCUMENTATION OF PUMPING VOLUMES (FLOW)

Documentation of pumped water releases to Las Vegas Wash is presented as the flow readings of outfalls 1 - P2, and 1A - P2. Documentation of pumped water outflows to the single infiltration pond used for this phase of construction was designated as outfall 2 - P2. Recorded volumes of water pumped to Las Vegas Wash and/or the infiltration pond between August 2nd and September 29th are presented in Table 1. Readings were taken daily while effluent was being released to the wash and total daily volume of water delivered to the wash determined. Volumes were determined for each outfall by taking daily readings of totalizing flow meters for each outfall and subtracting the previous periods readings. Early in Phase II the totalizing flow portion of the meter which monitored flows to the infiltration pond failed. Since this flow was not released to the wash it was decided that estimating flow using the flow meter (reading in gallons per minute) would be a defensible method for volume estimation. The days when estimates were made using flow readings from a meter rather than the totalizing flow record are noted in the table with a **. During the last 10 days of operations some problems with the totalizing flow meter on outfall 1-P2 were noted. For those days (9/20 and 9/24) a estimates of flows were used based on the highest values of surrounding days readings.

MEASUREMENT OF TDS

Total Dissolved Solids were measured using a Cole Parmer Con 410 Conductivity/TDS meter calibrated with a 3000 ppm NIST traceable standard. Effluent samples were taken for TDS measurements on the August 11 and on September 27th and 29th, 2000 (see Table 2). This measurement is specified in the Rolling Stock Permit and it was confirmed with Catherine Pool of NDEP that the measurements were to be made on dewatering effluent samples, not Las Vegas Wash samples. These data demonstrate that the TDS in the effluent stream delivered to the wash and the infiltration ponds may have risen slightly during the Phase II portions of project construction, but were below the levels observed during Phase I (see previous reports).

Table 1. Flow readings in thousands of gallons for all dewatering outfalls from August 2 through September 29, 2000. Outfall designation 1- P2 and 1A - P2 indicates release to wash, 2 - P2 indicate infiltration pond delivery not released to the wash.

Inclusive Dates	Outfall 1 - P2	Outfall 1A - P2	Outfall 2 - P2
8/2 - 8/3/2000	began pumping	not constructed	began pumping
8/3 - 8/4/2000	894*	not constructed	717
8/4 - 8/5/2000	2*	not constructed	shut down
8/5 - 8/6/2000	4374*	not constructed	shut down
8/6 - 8/7/2000	2177*	not constructed	shut down
8/7 - 8/8/2000	5*	not constructed	shut down
8/8 - 8/9/2000	2263	not constructed	3834
8/9 - 8/10/2000	3152	not constructed	2500**
8/10 - 8/11/2000	3372	not constructed	2500**
8/11 - 8/12/2000	3716	not constructed	2500**
8/12 - 8/13/2000	3877	not constructed	2500**
8/13 - 8/14/2000	4172	New outfall Begins	2500**
8/14 - 8/15/2000	3428	179	2500**
8/15 - 8/16/2000	3594	1619	2500**
8/16 - 8/17/2000	3738	1424	2500**
8/17 - 8/18/2000	3545	773	2500**
8/18 - 8/19/2000	3441	564	2500**
8/19 - 8/20/2000	3544	1662	2500**
8/20 - 8/21/2000	3571	1988	2500**
8/21 - 8/22/2000	3516	1753	2500**
8/22 - 8/23/2000	3714	1866	2500**
8/23 - 8/24/2000	3536	2406	2600**
8/24 - 8/25/2000	3697	2518	2600**
8/25 - 8/26/2000	3633	2976	2600**
8/26 - 8/27/2000	3842	3169	2600**
8/27 - 8/28/2000	3804	3124	2600**
8/28 - 8/29/2000	3496	2642	2600**
8/29 - 8/30/2000	flood shut down	flood shut down	flood shut down
8/30 - 8/31/2000	flood shut down	flood shut down	flood shut down
8/31 - 9/1/2000	flood shut down	flood shut down	flood shut down
9/1 - 9/2/2000	2341	flood shut down	2600**
9/2 - 9/3/2000	3434	1680	2600**
9/3 - 9/4/2000	3137	shut down	2600**
9/4 - 9/5/2000	3159	1835	2600**
9/5 - 9/6/2000	3279	812	2600**
9/6 - 9/7/2000	3037	1216	2600**
9/7 - 9/8/2000	3030	1456	2600**

Table 1. Continued.

Inclusive Dates	Outfall 1-P2	Outfall 1A2 - P2	2900**
9/8 - 9/9/2000	2926	1553	2900**
9/9 - 9/10/2000	2976	1411	1500**
9/10 - 9/11/2000	3180	1771	1500**
9/11 - 9/12/2000	3296	1735	1500**
9/12 - 9/13/2000	3345	284	3200**
9/13 - 9/14/2000	3254	shut down	3200**
9/14 - 9/15/2000	3289	shut down	3200**
9/15 - 9/16/2000	3226	shut down	3200**
9/16 - 9/17/2000	3352	shut down	3200**
9/17 - 9/18/2000	3355	shut down	3200**
9/18 - 9/19/2000	3239	shut down	3200**
9/19 - 9/20/2000	3295	shut down	3200**
9/20 - 9/21/2000	3400**	shut down	3200**
9/21 - 9/22/2000	3387	2	3200**
9/22 - 9/23/2000	3255	shut down	3200**
9/23 - 9/24/2000	3424	shut down	3200**
9/24 - 9/25/2000	3400**	shut down	3200**
9/25 - 9/26/2000	3346	shut down	3200**
9/26 - 9/27/2000	3429	shut down	3200**
9/27 - 9/28/2000	3164	shut down	3200**
9/28 - 9/29/2000	628	Dismantled	3200**
9/29 - 9/30/2000	Dismantled	Dismantled	Dismantled

* Flows variable due to system configuration and operational testing
** Total flow to pond was estimated from observations of flow rate which ranged from 1500 to 2200 gallons per minute during observation periods.

Table 2. Total Dissolved Solid (mg/l) Measurements from Dewatering Outfall Samples.

Date	Outfall 1 - P2	Outfall 1A - P2	Outfall 2 - P2
8/11/00	1290	not constructed	1480
9/27/00	1490	Dismantled	1670
9/29/00	1420	Dismantled	1540

ESTIMATION OF PERCHLORATE LOADINGS

Loading of perchlorate to the wash was estimated by taking daily samples of each effluent stream and analyzing the samples on site for perchlorate using a Cole Parmer ion specific perchlorate probe. This probe is sensitive to perchlorate levels down to approximately 0.5 ppm and is reliable and reproducible at levels above 1 ppm. The average of the readings for the previous day and current day was used as the concentration of perchlorate in a given outfall stream. The loading for a given outfall in kg/day was calculated based on the total flow and average concentration of that outfall. The volume of water delivered to the wash in each effluent was multiplied by the on-site measurements of perchlorate concentrations to determine a total load of perchlorate per day per effluent stream.

All data was recorded on field data sheets which included sampling time, volume and concentration data of all outfalls (see Attachment 1). Total loading to the wash was calculated as the sum of data for all outfalls released to the wash for the 24 hour period prior to daily sampling event (See Figure 1). Total volume of water delivered to the infiltration ponds was recorded on the data sheets and a note of Not Released entered in the total load column. Release of dewatering effluent to the wash was concluded on 9/29/00 at which time all dewatering activities ceased.

Field Quality Control Check Samples were measured each day prior to and after measurement of outfall samples. A 10 ppm standard was prepared from a commercially provided 1000 ppm standard and taken to the field for QC measurements. Analysis of these samples indicated accuracy of the probe to be within an average of 0.4 ppm of the standard (an average of 4% error rate) for all readings taken during Phase II.

All discharges within the 58 day dewatering period fell well below the permitted daily loading of 182 kg/day (see Figure 1). The allowable loading was specified in the revised Rolling Stock Permit #TNEV99008. As with the Phase I construction, the initial 15 days of dewatering experienced more fluctuations than the latter portion of the program due to adjustments needed to meet construction requirements while attempting to reduce loading to the wash. On-site management toward reduction of discharges to the wash is evident after day 15, although a flood in the middle of Phase II activities severely disrupted activities and occasional rises in discharge were experienced due to on-site construction requirements.

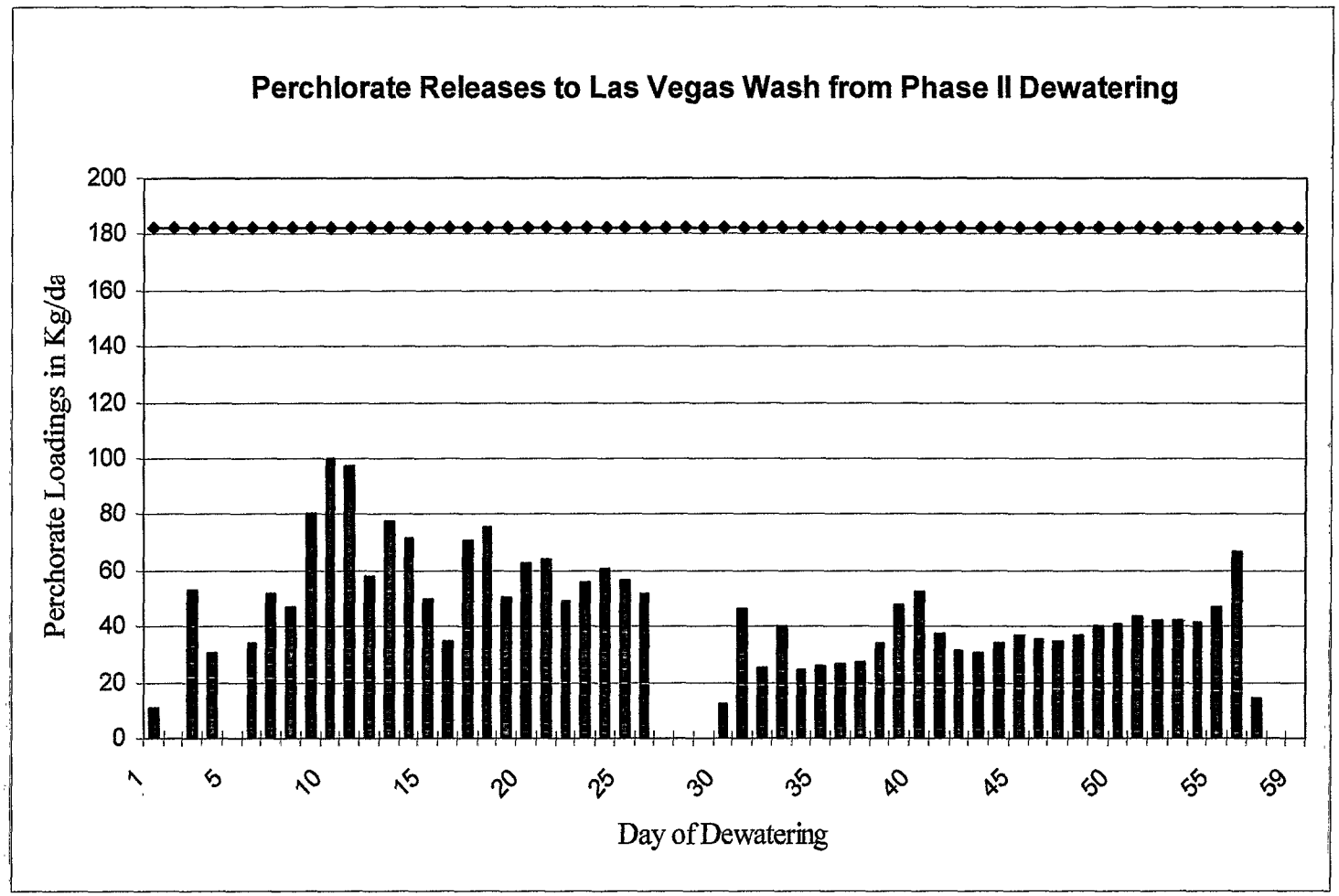

Figure 1. Daily loading of perchlorate in kilograms per day during Phase II construction on the Pabco Road Erosion Control Structure. Pumping was shut down on day 28-30 due to flooding on site.

SEDIMENT CONTROL

No increase in sediment loading resulting from construction activities during Phase II was observed during sampling activities. Typically the discharges were very clear and devoid of sediment as described in the previous report and depicted in Figure 1. It was observed that if construction activities created a potential sediment loading problem, the dewatering streams from those areas were diverted to the infiltration pond during the sediment producing period. The configuration of dewatering pipes and valves was designed to allow management of this issue. It was apparent that the type of dewatering process used and the management procedures instituted in this construction project did create a sediment loading threat to the wash.

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Figure 2. Typical Discharge Clarity of Dewatering Effluent During Phase II Construction.